

DETAILED ACTION

1. The examiner acknowledges and has entered the amendments/arguments filed on 13 August 2010. Claims **18-19** are cancelled by this amendment. Claims **1-15** were previously cancelled. Claims **16-17 and 20-36** are currently pending.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 13 August 2010 has been entered.

Claim Objections

3. Claim **31** is objected to for the following informality.

Regarding claim **31**, there is no antecedent basis for the limitation of "the positions of the identification elements". The examiner respectfully suggests that the applicant delete "the positions" and substitute it with --position--.

Further regarding claim **31**, the examiner respectfully suggests that the applicant delete "visually detectable visually" and substitute it with --visually detectable--.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

a) Claims **31, 33, 34 and 36**, drawn to a detector, and related method claims **16-17 and 20-30** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaish et al. (US 5,974,150) in view of Foster et al. (US 6,045,656).

Regarding claims **16-17, 20-22, 27-29, 31 and 34**, Kaish et al. discloses a detector for verifying that a plurality of objects is genuine (See Abstract), the object comprising:

a primary identifier in the form of a plurality of identification elements embedded in the object (Fig 1, item 3 and Col 12: lines 1-8),

the identification elements being detectable when illuminated by electromagnetic radiation in a range between infrared and ultraviolet (Col 19, lines 18-23; Col 13: lines 1-2; Col 14: lines 1-4; Col 16: lines 21-26; and Col 17: lines 49-51) and having at least one choice of dye that is visibly fluorescent (Col 20: lines 19-24),

but being indistinguishable from the rest of the object when illuminated with visible light (Col 12: line 63 thru Col 13: line 2),

the identification elements being randomly distributed so that the positions of the identification elements are unique to the object (Col 13, lines 11-20), and

the object further comprising a reference point in the form a printed symbol (See Fig 1, item 4 and Col 22, lines 38-46),

the detector comprising (Fig 2 and 3):

a source of electromagnetic radiation selected from the group consisting of infrared and ultraviolet wherein the identification elements are fluorescent (Col 19, lines 18-23);

a camera (Fig 2, item 35-36; Fig 3, item 44; and Col 23: lines 30-35) adapted to detect electromagnetic radiation emitted by said identification elements (Col 23: lines 30-35) in a sub-area of said object defined by the reference point (Fig 1: item 4; Col 22, lines 38-46; Col 28: lines 7-11 and 31-35) on said object to make a two-dimensional image when said sub-area is illuminated by said source of electromagnetic radiation (See Abstract and Col 22: line 58 thru Col 23: line 10 where the positional dimensions (x, y) represent the two-dimensions);

image analysis equipment for converting an said two-dimensional image made by the camera into alphanumerical code (See Fig 2, item 20; Fig 3, item 45; and Fig 4A, step 104 where any encrypted data in digital form can be considered an alphanumerical code);

a database into which the alphanumerical code can be recorded and from which codes relating to other recorded camera images can be retrieved (See Col 25, lines 1-5 and Fig 4A, step 107); and

processing equipment adapted to compare the alphanumerical code relating to the object being verified with the other codes already stored in the database relating to recorded camera images (See Fig 4B, step 115 and Col 25, lines 42-49);

wherein the detector is adapted to identify a sub-area of the object defined by the reference point and to record unique alphanumeric information relating to the positions

of the identification elements in the sub-area relative to the reference point (See Fig 1, item 4; Col 22, lines 38-46; and Col 23, lines 41-42).

Kaish et al. suggests authentication system that uses fluorescent dichroic fibers (See Abstract and Col 12: lines 1-8), containing a fluorescent dye (Col 12: lines 13-15) having an absorption coefficient ranging from infrared to ultraviolet (Col 19: lines 18-39) and emit radiation in the infrared to near-ultraviolet range (Col 21: lines 51-53). Kaish et al. further suggests that "the appropriate dye for use in a particular application will depend upon the specifics of the situation; therefore, Kaish et al. teaches a number of choices that are available when using the dichroic fluorescent fibers. Kaish et al. further suggests that ordinary fluorescent fibers may be used instead of dichroic fibers (Col 20: lines 37-43) and that "the fibers are randomly embedded...to form part of the substrate" which means "that by studying any one substrate, the pattern in any other substrate, and therefore a code representing that pattern, is not made apparent" (Col 12: lines 1-8); and furthermore teaches, "these fibers may be nearly invisible, yet are easily detectable by specialized detection apparatus" (Col 12: line 63 thru Col 13: line 2). Kaish et al. also suggests the use of dyes that are preferred for visible fluorescence (Col 20: lines 19-24) and lists numerous suitable dyes that can be used (Col 20: lines 20-36).

Kaish et al. does not explicitly teach that the dye for the fluorescent fibers is chosen so as to be indistinguishable under visible light and visible to the naked eye when illuminated by infrared or ultraviolet light.

Foster et al. teaches that the dye for the fluorescent fibers is chosen so as to be indistinguishable under visible light and visible to the naked eye when illuminated by ultraviolet light (See Abstract and Col 4: lines 13-28).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to modify the invention of Kaish et al. with the teachings of Foster et al. in order to add multiple levels of security to anti-counterfeit paper in order to make the paper harder to copy (See Foster et al., Col 3: lines 9-30).

Regarding claim **33**, Kaish et al. discloses wherein the detector is adapted to detect the location of the reference point on the object and to direct the image analysis equipment to a corresponding part of the image (Col 18, lines 2-7).

Regarding claims **24-26 and 36**, Kaish et al. discloses wherein the detector is adapted to recognize and record information relating to a unique secondary identifier (See, for example, Fig 1, items 8-10), and

processing equipment is adapted to compare the code relating to the object to be verified only to codes relating to recorded objects that have the same identifier (See Fig 1, items 8-10 and Col 22, lines 31-46 where the scanned pattern is compared to the message encoded in the MICR text, bar code and glyph pattern).

Regarding claim **23**, Kaish et al. discloses wherein corresponding numbers in each alphanumeric code are compared to within a specified tolerance level (Col 9, lines 51-56).

Regarding claim **30**, Kaish et al. discloses wherein the genuine object comprises paper, and includes adding the identification elements to the paper during the paper-making process (Col 19, line 55).

b) Claim **32** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaish et al. (US 5,974,150) as modified by Foster et al. (US 6,045,656), as applied to claim **31** above, and further in view of Smith (US 7,035,428).

Regarding claim **32**, Kaish et al. as modified by Foster et al. discloses all the limitations of claim **31**, and wherein the detector is adapted to detect the location of the reference point on the object (Col 18, lines 2-5).

Smith suggests an invention that uses registration marks to find and record surface features on an object for authentication purposes (See Abstract and Fig 3).

Kaish et al. and Foster et al. do not specifically teach directing the camera to the location of the reference point on the object after it is detected.

Smith teaches directing the camera to the location of the reference point on the object after it is detected (Col 8: lines 4-21).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to modify the invention of Kaish et al. and Foster et al. with the teachings of Smith in order to provide an object with multiple security features that is capable of self-authentication without requiring a database (See Smith, Col 4: lines 23-39).

c) Claim **35** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaish et al. (US 5,974,150) as modified by Foster et al. (US 6,045,656), as applied to claim **31** above, and further in view of Farrall et al. (US 7,353,994).

Regarding claim **35**, Kaish et al. as modified by Foster et al. discloses all the limitations of claim **31**, and wherein the image analysis equipment is adapted to divide the camera image into a plurality of sub-regions to produce a code corresponding to the camera image (See Fig 2, items 35-36; Fig 3, item 44; Col 24, lines 10-36; Fig 1, item 4; Col 22, lines 38-46; and Col 23, lines 41-4).

Farrall et al. suggests an invention used to detect a plurality of randomly distributed particles using a reader that is used for authentication purposes (See Abstract).

Kaish et al. and Foster et al. do not specifically teach counting the number of pixels illuminated in each sub-region.

Farrall et al. discloses counting the number of pixels illuminated in each sub-region (Col 7: lines 20-32).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to modify the invention of Kaish et al. and Foster et al. with the teachings of Farrell in order to provide an object with multiple security features that is capable of self-authentication using a pass/fail threshold at the point of use (See Farrall et al., Col 7: lines 20-32).

Response to Arguments

5. Regarding claim **31**, applicant has amended the claim to clarify that the identification elements are "visually" detectable "visually by the naked eye" and has further added a functional limitation to clarify that the camera is "adapted to detect electromagnetic radiation emitted by said identification elements in a sub-area of said object defined by the reference point on said object to make a two-dimensional image when said sub-area is illuminated by said source of electromagnetic radiation" and has clarified that the image analysis equipment is for converting the "two-dimensional" image and has argued that the previously cited prior art references do not teach these additional limitations.

Regarding claim **36**, applicant has amended the claim to clarify that the camera is directed to "the location of the reference point on the object".

Regarding claim **16**, applicant has amended the claim to clarify that the identification elements are "visually" detectable "by the naked eye" and has further added the steps of: "illuminating the identification elements in the sub-area with electromagnetic radiation selected from the group consisting of infrared and ultraviolet; creating a two-dimensional image of the electromagnetic radiation emitted by the identification elements in the sub-area; using the two-dimensional image to measure the positions of the identification elements in the sub-area; identifying a sub-area of an object to be verified defined by a reference point on the object to be verified; illuminating the identification elements in the sub-area of the object to be verified with electromagnetic radiation selected from the group consisting of infrared and ultraviolet;

and creating a two-dimensional image of the electromagnetic radiation emitted by the identification elements in the sub-area of the object to be verified"; and has argued the at the previously cited prior art reference does not teach these additional steps and limitations.

Regarding claim **22**, applicant has amended the claim to clarify that the object to be verified is "converted into" an alphanumeric code.

The examiner acknowledges the following arguments made by the applicant with regards to the prior art reference of Kaish et al. (US 5,974,150), hereinafter Kaish.

1) Applicant has argued that the fluorescent fibers of Kaish are not equivalent to applicant's claimed "identification elements" since Kaish does not specifically teach that the fibers are fluorescent (i.e. visually detectable by the naked eye) when exposed to infrared or ultraviolet light (See pages 7-8 of applicant's arguments).

2) Applicant has further argued that the fluorescent fibers of Kaish are not fluorescent (i.e. visually detectable by the naked eye) when exposed to ultra-violet light because Kaish "only" discloses that the fluorescent fibers absorb and emit light in the infrared to near-ultraviolet range (See page 7 of applicant's arguments).

3) Applicant further argues that near-ultra violet light is not ultraviolet light because it does not include the entire range of ultraviolet light (See page 8 of applicant's arguments).

4) Applicant also argues that the fluorescent fibers of Kaish do not emit light in the visible spectrum when exposed to radiation (See page 8 of applicant's arguments).

5) Last of all, applicant argues that the fluorescent fibers of Kaish are not indistinguishable to the naked eye when viewed in visible light and that the teachings of the background of the art are not relevant to the understanding of the use of fluorescent fibers as is known in the art (See page 8 of applicant's arguments).

The examiner disagrees with all of applicant's arguments and believes that the prior art reference of Kaish, as read with the understanding of a person of ordinary skill in the art, clearly teaches that dichroic fluorescent fibers are known to be fluorescent in the visible spectrum when exposed to infrared or ultraviolet light and that Kaish teaches this use as one of the choices available to one of ordinary skill in the art.

The examiner notes the following teachings by the applicant with regards to the claimed "identification elements". The applicant states that "typically, the identification elements comprise fibres...(that) are fluorescent...and are provided with a fluorescent coating (e.g. by being dyed with a fluorescent dye)" (See pages 4 and 5 of the specification) ; and further that the dye "is a fluorescent dye, so that the dyed fibers can absorb ultraviolet radiation and emit visible light" (See page 15 of the specification). The examiner further emphasizes for the record that the applicant admits that it is known in the prior art to embed ultraviolet fibers in paper and use it for creating a banknote (See page 2 of the specification).

Kaish teaches an authentication system that uses fluorescent dichroic fibers (See Abstract and Col 12: lines 1-8), containing a fluorescent dye (Col 12: lines 13-15), that is an improvement over authentication systems that use ordinary fluorescent fibers (Col 12: lines 1-8 and Col 3: lines 10-17). The dichroic fluorescent fibers add another

security feature by including the property of polarization in addition to the fluorescent property and have an absorption coefficient ranging from infrared to ultraviolet (Col 19: lines 18-39) and emit radiation in the infrared to near-ultraviolet range (Col 21: lines 51-53). Kaish further teaches that "the appropriate dye for use in a particular application will depend upon the specifics of the situation; therefore, Kaish teaches a number of choices that are available when using the dichroic fluorescent fibers.

Kaish further teaches that ordinary fluorescent fibers may be used instead of dichroic fibers (Col 20: lines 37-43) and that "the fibers are randomly embedded...to form part of the substrate" which means "that by studying any one substrate, the pattern in any other substrate, and therefore a code representing that pattern, is not made apparent" (Col 12: lines 1-8); and furthermore teaches, "these fibers may be nearly invisible, yet are easily detectable by specialized detection apparatus" (Col 12: line 63 thru Col 13: line 2). Kaish also teaches the use of dyes that are preferred for visible fluorescence (Col 20: lines 19-24) and lists numerous suitable dyes that can be used (Col 20: lines 20-36). In view of these teachings, Kaish clearly discloses that a dichroic fluorescent fiber can be embedded in a document of value, such as a banknote, using known dyes that absorb light in the infrared or ultraviolet spectrum and emit light in the visible spectrum and further that the fibers are indistinguishable when viewed with the naked eye from other fibers, which is an inherent property of the fibers.

Nevertheless, in order to expedite prosecution of the case, the examiner has agreed to allow the current amendment to overcome the prior art reference of Kaish since Kaish does not explicitly teach using infrared or ultraviolet light to cause the

fluorescent fibers to be visible and that the fluorescent fibers are indistinguishable when viewed with the naked eye; therefore, the rejection of claims **16-36** under 35 U.S.C. 102(b) is withdrawn. However, a new ground(s) of rejection is made under the newly found prior art references of Foster et al. (US 6,045,656), Smith (US 7,035,428) and Farrall et al. (US 7,353,994) which clearly strengthen the examiner's case regarding the inherent properties of fluorescent fibers.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Smith (US 7,251,347) which teaches a workpiece authentication system that uses reference marks to indicate unique information related to the surface of an object that represents a form of signature for authenticating the object (See Fig 6 and Abstract).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL ANDLER whose telephone number is (571) 270-5385 and whose e-mail address is michael.andler@uspto.gov. The examiner can normally be reached on Monday-Friday 7:30 AM to 3:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lee can be reached on (571) 272-2398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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